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Award Number: MIPR 5EDAMM5047

TITLE: Incorporating New Technology to Create a Comprehensive Realistic Training Environment for the 91W

PRINCIPAL INVESTIGATOR: Joseph P. Miller, M.D.

CONTRACTING ORGANIZATION: Madigan Army Medical Center
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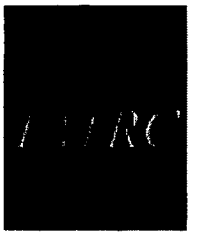
FY05 Mid-Term Report



PROPOSAL NO.: 2004011074
MIPR No.: 5EDAMM5047
TITLE: Incorporating New Technology to Create a Comprehensive Realistic Training Environment for the 91W

ACCOMPLISHMENTS

(30,000 Character Limit)

PI's Evaluation:

This proposal was one of eleven proposals submitted by Madigan Army Medical Center's Andersen Simulation Center (ASC). The mission of the ASC is to provide an environment where medical training using simulation can improve patient care in real-world clinical and tactical situations. This proposal fits directly into that mission and it has increased our ability to meet that mission.

Our first step in developing and implementing our realistic training environment was to develop a collaborative and productive relationship with the target audience, the combat 91W, or more specifically their commanders and training infrastructure. The Battle Command Training Center (BCTC) is responsible for all aspects of virtual and constructive training performed at Fort Lewis. The one area where they lack expertise is medical training and in fact, prior to our joining of forces, they did no medical training whatsoever. We are collaborating with them and the Medical Director of the ASC (Proposal PI) is treated as an equal to the other Program Managers throughout the center. The ASC Medical Director has become their subject matter expert for medical training. We have jointly put on briefings, developed training modules (discussed below) and formed a partnership that has turned heads from Washington state to Washington DC.

This simple collaboration between a MEDCOM and a FORSCOM asset has generated a tremendous amount of publicity and support and is viewed as a major accomplishment by itself. Since June, we have briefed numerous government planning groups, retired General Officers, the TRIWEST Executive Council, the AUSA Senior Leadership Council, the Surgeon General, the FORSCOM CG, the TRADOC CG, the Assistant Secretary of Defense for Health Acquisition and the Secretary of the Army. With respect to specific accomplishments related to this proposal, the first is that we are training soldiers today. Every dollar spent produces a product that advances the training of soldiers today at Fort Lewis and has the possibility of making changes in the way we train all soldiers in the future.

Two additional near-term accomplishments come directly from our partnership with the BCTC. MicroSim is a virtual training product produced by Laerdal Medical and purchased by OTSG over two years ago. Forty thousand individual licenses were bought for each medic during the 91W transition as his/her own continuous study guide for training. To date approximately six thousand licenses have been issued. The reason for the low usage is inadequate dissemination of information as well as logistical and technical issues with the licenses. The ASC tried to get MAMC to distribute the software over a year and a half ago without success. The Mission Support Training Facility (MSTF) a branch of the BCTC conducts all the computer based training for the post and has the infrastructure to handle an implementation of this type. In the two weeks since showing the software to the 1st Corps CG, we have issued 200 licenses and the CG wants every soldier on Fort Lewis (all 18,000) to have access to it. The accomplishment here is not that the ASC created the software but that we opened lines of communication and educated a FORSCOM Commander about a training tool that was already paid for and sitting unused on a shelf.

The next near term accomplishment is our integration of mannequin-based simulation into Engagement Skills Training. The Engagement Skills Trainer 2000 (EST) is a computer driven pneumatic assisted system were soldiers fire modified weapons at an images projected on a screen. The computer will record hits and misses. The system simulates static and dynamic targets as well as fire/no-fire situations. By incorporating mannequin-based simulation into the EST lanes, multiple objectives are attainable. A patient is introduced into the scenario between firing positions and the adjacent soldiers must provide the appropriate first responder care. Combat Life Saver (CLS) skills are then tested, ultimately followed by the medic. In this way, care through all phases of Tactical Combat Casualty Care (TC3) is tested. All the while, team leader training can be ongoing where the leader must control resources, call for MEDEVAC, redirect firing positions so that he can still effectively engage the enemy.

To date, the majority of the new equipment purchased has not arrived but through our feedback the one company that we have received equipment from will retrofit all equipment purchased because the comments we made were incorporated into their product.

Our message is being heard and we are training soldiers today. We have won the respect of the 1st Corps Commander and he has given the ASC and MAMC the lead in the development of a comprehensive medical training program for the SBCT's on Fort Lewis.

PROBLEMS/ISSUES

(30,000 Character Limit)

PI's Evaluation:

The problems and issues we have encountered so far in this project are focused around two areas, technical issues associated with the simulators themselves and programmatic or implementation issues.

Technical

From my review of all currently commercially available mannequin based systems, none completely meets the needs of the army. The training of Combat Medics demands a self contained, trauma-capable, portable, durable, wireless and interactive system. This system must realistically represent a patient through all levels of battlefield care from point of wounding to level 1, level 2 and ultimately level 3 medical facilities. With program funding, I have purchased what I believe are the two best-fit currently available systems for the army's needs. We have received only one of the systems so far. This system does not have trauma modules but they are scheduled for delivery in September. This system, a new design, has been fraught with manufacturing and technical difficulties. The mannequins have been down more then up but the company has agreed to retrofit all internal pneumatic systems when they deliver the additional modules in September. I still am somewhat optimistic.

None of these systems are durable enough to be used in a realistic field environment. Fireman's carries, patient dragging, two man buddy drags are all common ways to move casualties short distances on the battlefield yet these maneuvers destroy simulator mannequins. Not all of the mannequins have military airworthiness statements. In fact, to my knowledge only one has it for rotary wing aircraft. Not all systems have trauma capabilities or pulses in all extremities. No system can alter physiology based on actual volume resuscitation. No system can tolerate getting wet. In short, none are driven by our requirements; they are only what the company has to offer.

The virtual non-mannequin systems are voluminous but few are ready for commercialization. The majority focus on CBRNE issues or EMS triage. The vast majority of the few systems that do have trauma do not use the TC3 principles of care. All companies say they can "fix that" if we can get them "some funding." We have found one system that does use TC3 and will be receiving 10 copies for demonstration and beta testing next week.

Programmatic Issues

This is a dissertation in its' own right. The start-up costs are tremendous. GWOT funds and grants like this are the only way we have been able to remain open. One mannequin will not make a simulation center. Training soldiers, especially trying to cover the principles of MASCALs and triage, takes at least 5-6 mannequins in my opinion. You can display multiple

different patients with one mannequin but the tremendous value of multiple patients simultaneously cannot be understated. Each mannequin needs a technician with at least basic medical knowledge. This leads to a large labor cost. Unit assets are often used but they lack the experience with the mannequins to rapidly deal with problems. I believe it is better to use unit personnel as evaluators.

Another major problem with army medical simulation has been lack of focused approach. Multiple different centers are all working on it from their own specific focus and in many ways; they do not want to collaborate with others. They think someone is coming to take their "stuff" or their "credit". Additionally, simulation equipment is pooled at Fort Sam Houston with little being pushed out to other posts. The focus is initial entry training with little or no focus on sustainment training. A new program, the Medical Simulation Training Center Program, is a step in the right direction but a very small step. It is the first attempt to use central funding to push equipment and manpower to FORSCOM posts for sustainment training in the principles of TC3 and CLS. However, a major oversight has occurred in my opinion. There is still no emphasis on collective skills, or the collective application of individual skills. There is a major difference between performing a surgical airway in a classroom or even outside on the ground and in a moving ambulance, helicopter or Stryker. There is still no funding to provide that type of training. That is where we are focusing our efforts.

All of this will be for nothing unless we are able to get unit commanders to see that medical skills and tasks are an intricate part of their mission. It is not their primary mission but it allows them to improve their unit morale and mission effectiveness. We must get unit commanders to not ask subordinate units to train for "movement to contact" but to train for "movement to contact with casualties." In this way, the commander can evaluate how the leaders adapt to change, care for their soldiers and remain combat effective.

Second Half Project LifeCycle

(30,000 Character Limit)

PI's Evaluation:

See key milestones dates and milestones below:
01 APR 05 - BCTC Collaboration
01 MAY 05 - Standardized Simulated Patients (Advanced Combat Trauma Training)
15 JUN 05 - All Funding Obligated
01 SEP 05 - MicroSim Incorporation
01 SEP 05 - Mannequin/EST Integration
15 SEP 05 - First Field Deployment w/ 2CR
01 OCT 05 - All Purchased Resources On Site
01 OCT 05 - New Mannequin Incorporation
01 NOV 05 - BMIS-T/Simulator Training
01 DEC 05 - Finalization Of Training Program

We will continue to implement and refine the individual portions of the program as equipment arrives and unit-training schedules allow. We already have identified and recruited key personnel in all areas. We hope to have a complete working draft to implement by 1 December. This will leave us 6 to 9 month to test and further refine the program as needed.

Deliverable Update

(30,000 Character Limit)

PI's Evaluation:

Our first and foremost deliverable is an exportable roadmap for training that includes basic individual and core collective tasks. Commanders can then add or subtract from these guidelines as they see fit for their unit. Through our collaboration with the medical and command staffs of 3rd Brigade 2nd Infantry Division and 2nd Cavalry Regiment, we have an initial list of required individual skills broken down into three classes: first responders, combat life savers and 91Ws. We are now drafting the live, virtual and constructive training environments to meet those requirements and mapping them into an ARFORGEN matrix of Reset/Train, Ready and Available cycles. That will be our ultimate goal.

In the other sections of this document, I have provided a description of my experience and whether simulation can be used to train soldiers for deployment. The obvious answer is yes. Nevertheless, until we can create a realistic training environment where collective tasks can be measured in the field, we will only have part of the answer.

From a technical standpoint, I have very little to offer at this time. Many of the purchases have either not arrived or arrived just recently. The one product I can comment on is the Gaumard HAL mannequin. I was quite optimistic when I first saw this completely self-contained wireless mannequin. However, manufacturing issues (e.g. kinked hoses leading to low pressures and loss of functions) repeatedly frustrate us. I believe many of these issues will be solved, but for now, this is not a solution for the army's requirements. More will follow as we progress.

Expenditures

(Please fill in table below)

Element of Resource (EOR)	3Q FY 05 Apr 1 - June 30	4Q FY 05 Jul 1 - Sep 30
Travel 2100		
Shipping 2200	$500.00*	
Rent & Communications 2200		
Contract for Services 2500		
Supplies 2600		
Laerdal Consumables	$5,403.50	
Equipment 3100		
Gaumard HAL Mannequin(2)	$39,491.00	
Digital Light Projectors & Supporting Equipment	$8,322.36	
Laerdal SimBaby	$38.131.00	
Computer for SimBaby	$2,474.00	
HP IPQ H5550 Pocket PC (10)	$7,026.00	
Super Computer (Training Video Production)	$3,026.00	
Software for Super Computer	$1,765.00	
Laerdal IV Simulator	$13,022.00	
Laerdal ALS Manikin (2) and 3 Vital Sims	$22,121.26	
Gaumard Mannequin (1)*	$16,795.75*	
Chest Tube Mannequin, Cricothyrotomy Mannequin, Wheeled Stretcher and Triage System		$5,201.67
Total Purchases	$163,279.54	

Financial Narrative
(30,000 Character Limit)

PI's Evaluation:

I have no major comments to make at this time. The specific items purchased are listed above. When all arrive, my hope is that we will have enough equipment to put these new mannequins in the field, in the HMMWVs, in the Strykers and test whether they can be used effectively. I will try to track the cost of repair as well as track manpower hours required to make training possible. From our center's prior experience, for every one hour of mannequin based training in the field approximately ten hours of instructor time is needed when travel, setup and clean up time are included. We will try to get a better handle on the actual requirement.

The other main issue related to finance that has been a major problem specific to our institution has been the relationship between MEDCOM and FORSCOM. In many ways, MEDCOM has been somewhat resistant to spending money for FORSCOM soldiers and FORSCOM has been somewhat resistant to paying when they had been getting training free in the past.

We are now at a point where both sides agree that if we offer training, adequate reimbursement should be expected. However, making that happen is another story. We are making progress but only because a Brigadier and a Lieutenant General are behind it and continue to push for cooperation. Whenever that point is "forgotten" by a staff officer, the answer we hear is "it can not be done." When that staff officer is reminded of the commander's intent, progress continues.

Even today, while we are applauded for breaking down walls, we are hearing rumors that the pots of money are not working out and we will eventually have to go our own ways. I hope that will not happen. Again, as I said earlier, more to follow.

*** * * END OF REPORT * * ***